What is claimed is:

1. An image display device including a panel having a first electrode which extends in a first direction to write image data and a second electrode which extends in a second direction to select a display line, wherein a field period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a) writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, into the panel through the first electrode and the second electrode, and (b) sustaining an illumination state of ON or OFF in each cell for each sub-field period using luminance equivalent to a luminance weight of each sub-field period, based on the written sub-field image data, the image display device comprising

an image changing unit for changing a part of sub-field image data of a predetermined sub-field period, so that a total number of charges and discharges performed on the first electrode when writing the sub-field image data becomes smaller.

2. An image display device including a panel having a first electrode which extends in a first direction to write image data and a second electrode which extends in a second direction to select a display line, wherein a field

period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a) writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, into the panel through the first electrode and the second electrode, and (b) sustaining an illumination state of ON or OFF in each cell for each sub-field period using luminance equivalent to a luminance weight of each sub-field period, based on the written sub-field image data, the image display device comprising

an image changing unit for changing a part of sub-field image data of a predetermined sub-field period, so that a total amount of power supplied through the first electrode when writing the sub-field image data becomes smaller.

3. An image display device including a panel having a first electrode which extends in a first direction to write image data and a second electrode which extends in a second direction to select a display line, wherein a field period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a) writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, into the panel

through the first electrode and the second electrode, and (b) sustaining an illumination state of ON or OFF in each cell for each sub-field period using luminance equivalent to a luminance weight of each sub-field period, based on the written sub-field image data, the image display device comprising

an image changing unit for changing a part of sub-field image data of a predetermined sub-field period, so that adjacent cells in the first direction, which correspond to the part of the sub-field image data, are uniformly one of ON and OFF in the predetermined sub-field period.

4. An image display device including a panel having a first electrode which extends in a first direction to write image data and a second electrode which extends in a second direction to select a display line, wherein a field period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a) writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, into the panel through the first electrode and the second electrode, and (b) sustaining an illumination state of ON or OFF in each cell for each sub-field period using luminance equivalent to a luminance weight of each sub-field period, based on

the written sub-field image data, the image display device comprising

an image changing unit for changing, when a part of sub-field image data of a predetermined sub-field period has a higher spatial frequency than a predetermined value, the part of the sub-field image data so as to decrease the spatial frequency, while keeping average luminance of the part of the sub-field image data in the entire field period, within a certain range.

5. An image display device including a panel having a first electrode which extends in a first direction to write image data and a second electrode which extends in a second direction to select a display line, wherein a field period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a) writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, into the panel through the first electrode and the second electrode, and (b) sustaining an illumination state of ON or OFF in each cell for each sub-field period using luminance equivalent to a luminance weight of each sub-field period, based on the written sub-field image data, the image display device comprising

an image changing unit for changing, when a part of

sub-field image data of a predetermined sub-field period has a higher spatial frequency than a predetermined value, the part of the sub-field image data so that

(a) cells corresponding to pixels which form the part of the sub-field image data are uniformly OFF in the predetermined sub-field period, and uniformly one of ON and OFF in a sub-field period having a smaller luminance weight than the predetermined sub-field period, if a luminance weight of the predetermined sub-field period is not the smallest luminance weight of the plurality of sub-field periods, and

(b) the cells corresponding to the pixels which form the part of the sub-field image data are uniformly one of ON and OFF in the predetermined sub-field period, if the luminance weight of the predetermined sub-field period is the smallest luminance weight.

6. The image display device of Claim 5,

wherein when at least three adjacent cells in the first direction which correspond to the pixels that form the part of the sub-field image data of the predetermined sub-field period are inverted from each other, and if the luminance weight of the predetermined sub-field period is not the smallest luminance weight, the image changing unit changes the part of the sub-field image data so that the cells corresponding to the pixels which form the part of the sub-field image data are uniformly OFF in the predetermined

sub-field period, and uniformly ON in the sub-field period having the smaller luminance weight.

7. The image display device of Claim 5,

wherein if the luminance weight of the predetermined sub-field period is the smallest luminance weight, the image changing unit uses an auxiliary sub-field period whose luminance weight is substantially one-half of the smallest luminance weight, and changes the sub-field image data so that cells corresponding to all pixels which form the sub-field image data are uniformly OFF in the predetermined sub-field period, and uniformly ON in the auxiliary sub-field period.

8. The image display device of Claim 5,

wherein when at least three adjacent cells in the first direction that correspond to the pixels which form the part of the sub-field image data of the predetermined sub-field period are inverted from each other, and if the luminance weight of the predetermined sub-field period is the smallest luminance weight, the image changing unit changes the part of the sub-field image data so that the cells corresponding to the pixels which form the part of the sub-field image data are uniformly OFF in the predetermined sub-field period.

9. The image display device of Claim 5,

wherein when at least three adjacent cells in the first direction that correspond to the pixels which form the part of the sub-field image data of the predetermined sub-field period are inverted from each other, and if the luminance weight of the predetermined sub-field period is the smallest luminance weight, the image changing unit changes the part of the sub-field image data so that the cells corresponding to the pixels which form the part of the sub-field image data are uniformly ON in the predetermined sub-field period.

10. The image display device of Claim 5,

wherein when the part of the sub-field image data of the predetermined sub-field period has the higher spatial frequency than the predetermined value only in the first direction, the image changing unit determines whether to change the part of the sub-field image data, depending on a proportion of a number of pixels which form the part of the sub-field image data to a total number of pixels which form the sub-field image data.

11. The image display device of Claim 10,

wherein the image changing unit does not change the part of the sub-field image data, when the cells corresponding to the pixels which form the part of the sub-field image data are not inverted from each other in the second direction.

12. The image display device of Claim 10, wherein the image changing unit does not change the part of the sub-field image data, when the part of the sub-field image data has the higher spatial frequency only in the second direction.

13. An image display device including a panel having a first electrode which extends in a first direction to write image data and a second electrode which extends in a second direction to select a display line, wherein a field period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a) writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, into the panel through the first electrode and the second electrode, and (b) sustaining an illumination state of ON or OFF in each cell for each sub-field period using luminance equivalent to a luminance weight of each sub-field period, based on the written sub-field image data, the image display device comprising

an image changing unit for changing, when a part of sub-field image data of a predetermined sub-field period which is no smaller than one-half of the sub-field image data has a higher spatial frequency than a predetermined

value, the sub-field image data so that cells corresponding to all pixels of the sub-field image data are uniformly ON in the predetermined sub-field period, while keeping average luminance of the sub-field image data in the predetermined sub-field period, within a certain range.

14. The image display device of claim 1 ~~one of Claims 1, 2, 3, 4, 5, and 13~~,

wherein the image changing unit changes the part of the sub-field image data or the sub-field image data, only when the predetermined sub-field period has a smaller luminance weight than a predetermined value.

15. The image display device of claim 1 ~~one of Claims 1, 2, 3, 4, 5, and 13~~,

wherein the image changing unit changes the part of the sub-field image data or the sub-field image data, only when an amount of power required to drive the first electrode is greater than a predetermined value.

16. An image display device including a panel having a first electrode which extends in a first direction to write image data and a second electrode which extends in a second direction to select a display line, wherein a field period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a)

writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, into the panel through the first electrode and the second electrode, and (b) sustaining an illumination state of ON or OFF in each cell for each sub-field period using luminance equivalent to a luminance weight of each sub-field period, based on the written sub-field image data, the image display device comprising:

image data storing means for storing sub-field image data of each sub-field period;

pattern detecting means for reading sub-field image data of a predetermined sub-field period from the image data storing means, and detecting whether a part of the read sub-field image data has a specific pattern that causes a substantial increase in power consumption when writing the sub-field image data; and

image changing means for, when the part of the sub-field image data having the specific pattern is detected by the pattern detecting means,

(a) reading the sub-field image data of the predetermined sub-field period from the image data storing means, changing the part of the sub-field image data so that cells corresponding to pixels which form the part of the sub-field image data are uniformly OFF in the predetermined sub-field period, and storing the changed sub-field image data back into the image data storing means,

and

(b) reading sub-field image data of a sub-field period whose luminance weight is smaller than the predetermined sub-field period from the image data storing means, changing a corresponding part of the read sub-field image data so that the cells corresponding to the pixels which form the corresponding part of the sub-field image data are uniformly ON in the sub-field period, and storing the changed sub-field image data back into the image data storing means.

17. An image display device including a panel having a first electrode which extends in a first direction to write image data and a second electrode which extends in a second direction to select a display line, wherein a field period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a) writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, into the panel through the first electrode and the second electrode, and (b) sustaining an illumination state of ON or OFF in each cell for each sub-field period using luminance equivalent to a luminance weight of each sub-field period, based on the written sub-field image data, the image display device comprising:

image data storing means for storing sub-field image data of each sub-field period;

pattern detecting means for reading sub-field image data of a predetermined sub-field period from the image dada storing means, and detecting whether a part of the read sub-field image data has a specific pattern that causes a substantial increase in power consumption when writing the sub-field image data;

comparing means for comparing, when the part of the sub-field image data having the specific pattern is detected by the pattern detecting means, a number of pixels which form the part of the sub-field image data with a predetermined number;

image changing means for (a) reading, when the number of pixels is no smaller than the predetermined number, the sub-field image data of the predetermined sub-field period from the image data storing means, (b) changing the read sub-field image data so that cells corresponding to all pixels of the sub-field image data are uniformly ON in the predetermined sub-field period, and (c) storing the changed sub-field image data back into the image data storing means; and

luminance controlling means for changing a luminance weight of the predetermined sub-field period, so that average luminance of the sub-field image data in the predetermined sub-field period is kept within a certain range.

18. A computer program for processing image data of a field period, wherein the field period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a) writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, and (b) sustaining an illumination state of ON or OFF in each cell in a panel for each sub-field period based on the written sub-field image data, the computer program comprising

an image changing step for

changing a part of sub-field image data of a predetermined sub-field period which has a specific pattern that causes a substantial increase in power consumption when writing the sub-field data, so that cells corresponding to pixels which form the part of the sub-field image data are uniformly OFF in the predetermined sub-field period, and

changing a corresponding part of sub-field image data of a sub-field period having a smaller luminance weight than the predetermined sub-field period, so that the cells corresponding to the pixels which form the corresponding part of the sub-field image data are uniformly ON in the sub-field period.

19. A computer program for processing image data of a field period, wherein the field period is divided into a plurality of sub-field periods that each have a predetermined luminance weight, and a gray-scale image for the field period is displayed by (a) writing sub-field image data of each sub-field period obtained by dividing input image data of the field period into the plurality of sub-field periods, and (b) sustaining an illumination state of ON or OFF in each cell in a panel for each sub-field period based on the written sub-field image data, the computer program comprising

an image changing step for changing sub-field image data of a predetermined sub-field period which has a specific pattern that causes a substantial increase in power consumption when writing the sub-field data, so that cells corresponding to pixels which form the sub-field image data are uniformly ON in the predetermined sub-field period, while keeping average luminance of the sub-field data in the predetermined sub-field period within a certain range.

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